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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,155	11/25/2003	Theodore R. Sana	10030511-1	8586

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EXAMINER	
KIM, YOUNG J	
ART UNIT	PAPER NUMBER
1637	
MAIL DATE	DELIVERY MODE
03/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,155	SANA ET AL.	
	Examiner	Art Unit	
	Young J. Kim	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 33-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 33-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The present Office Action is responsive to the Amendment received on December 210, 2007.

Preliminary Remark

Claims 10-32 are canceled.

Claims 39-48 are new.

Claim Objections

The objection of claim 1 for a minor typographical error, noted in the Office Action mailed on October 3, 2007 is withdrawn in view of the Amendment received on December 21, 2007.

Claim Rejections - 35 USC § 103

Rejections, Maintained & Necessitated by Amendment

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The rejection of claims 1-9 and 33-38 under 35 U.S.C. 103(a) as being unpatentable over Cantor et al. (WO 99/22025, published May 6, 1999) in view of Baldeschwieler et al. (WO 95/25116, published September 21, 1995), made in the Office Action mailed on October 3, 2007 is maintained for the reasons already of record.

In addition, claims 39-48 are included herein, as being necessitated by Amendment (by way of their addition).

Applicants' arguments presented in the Amendment received on December 21, 2007 have been fully considered, but they are not found persuasive for the reasons set forth in the, "Response to Arguments," section.

The Rejection:

Cantor et al. disclose an array comprising degenerate oligonucleotides, wherein said array comprises 1.64 million different degenerate 16-mers (page 6, lines 17-19), comprising at least one degenerate nucleotides (see Figures 1, 3, and 4).

With regard to claims 2, 5, 7, and 34-48, the probes are oligonucleotides which consists of more than one nucleotides (thus, a polynucleotide)

Cantor et al. do not explicitly disclose a method of making their degenerate array.

Cantor et al. do not explicitly disclose that the method of synthesizing the array involve a dispenser comprising at least one droplet dispensing device.

Baldeschwieler et al. disclose a method of synthesizing an array via use of an inkjet technology, wherein the method involves the attachment of molecules onto a substrate surface (page 1, lines 23-25), for sequential synthesis of polynucleotides (page 2, lines 1-3), wherein the reagents are dispensed from a microdrop dispensing device (page 3, lines 14-15).

The artisans teach the deprotection step (i.e., activation of the protected monomers) so as to "grow" the nucleotides thereto (page 4, lines 1-20).

Baldeschwieler et al. disclose that in an embodiment, a five jet system is used, each jet for dispensing one of the four nucleotide bases, and one jet for activating tetrazole solution (page 13, lines 7-10).

Baldeschwieler et al. disclose the use of computer in controlling the deposition process (page 19, lines 3-9).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Cantor et al. with the teachings of Baldeschwieler et al., thereby arriving at the claimed invention for the following reasons.

Cantor et al. already discloses a microarray comprising a plurality of degenerate oligonucleotides, said degenerate oligonucleotides comprising at least one degenerate nucleotides. While the artisans are not explicit in disclosing a particular method of fabricating such an array, one of ordinary skill in the art would have clearly recognized various methods for fabricating a microarray at the time the invention was made, including the method disclosed by Baldeschwieler et al.

Baldeschwieler et al. explicitly disclose a method of fabricating an array via use of an inkjet technology, wherein the method involves the attachment of molecules (biopolymer subunit precursors) onto a substrate surface (page 1, lines 23-25), for sequential synthesis (by multiple round of subunit additions) of polynucleotides (page 2, lines 1-3), wherein the reagents are dispensed from a microdrop dispensing device (page 3, lines 14-15).

While Baldeschwieler et al. are not explicit in stating that a mixture of different biopolymer subunit precursors be provided during at least one round of multiple rounds of subunit additions, one of ordinary skill in the art would have clearly recognized that when "growing" a degenerate polynucleotide probe on an array's surface, said one of ordinary skill in the art need not have limited him/herself to rounds of monomer additions, but also series of dimer additions.

Since a degenerate oligonucleotide probe disclosed by Cantor et al. comprised a mixture of nucleotide sequences, deposition of dimers in fabricating the array of Canter et al. by the method disclosed by Baldeschwieler et al. would have been resulted in the invention as claimed, rendering the invention as claimed *prima facie* obvious over the cited references.

Response to Arguments:

Applicants traverse the rejection of record.

Applicants state that the independent claims have been amended to now require that "two or more different biopolymer subunit precursors to said feature location in at least one round of multiple rounds of subunit additions," and that the prior art of record does not disclose or suggest this limitation (Page 8, bottom paragraph to page 9, Response).

It is respectfully disagreed.

The claims have been amended to require that the method provides a, "mixture of two or more different biopolymer subunit precursors to said feature location in ***at least*** one round of multiple rounds of subunit additions."

This means that the so called, "two or more different biopolymer subunit precursors" need not be deposited to a feature location *at once*, but can be applied in more than single round, such as second round, third round, etc.

Therefore, addition of the first monomer in the first round, followed by the addition of the different monomer in the second round would necessarily meet the requirement of the phrase, "mixture of two or more biopolymer subunit precursors to said feature location in ***at least*** one round of multiple rounds of subunit additions."

Therefore, the rejection as stated is proper and thus maintained.

Rejection, New Grounds – Necessitated by Amendment

The present rejection is made for the alternative interpretation of the amended claims which can be drawn to providing, a mixture of "two or more" different biopolymer subunit precursors to a feature location in a single round of subunit addition.

The claim does not require that mixture of two or more different biopolymer subunit precursors are provided to form a single degenerate probe, but rather that the mixture of two or more different biopolymer subunit precursors are provided to a feature location. A single feature location can contain multiple probes (as will be discussed below), the rejection based on this interpretation will be made below.

Claims 1-9 and 33-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantor et al. (WO 99/22025, published May 6, 1999) in view of Baldeschwieler et al. (WO 95/25116, published September 21, 1995) in light of Chetverin et al. (U.S. Patent No. 6,103,463, issued August 15, 2000).

Cantor et al. disclose an array comprising degenerate oligonucleotides, wherein said array comprises 1.64 million different degenerate 16-mers (page 6, lines 17-19), comprising at least one degenerate nucleotides (see Figures 1, 3, and 4).

With regard to claims 2, 5, 7, and 34-48, the probes are oligonucleotides which consists of more than one nucleotides (thus, a polynucleotide)

Cantor et al. do not explicitly disclose a method of making their degenerate array.

Cantor et al. do not explicitly disclose that the method of synthesizing the array involve a dispenser comprising at least one droplet dispensing device.

Baldeschwieler et al. disclose a method of synthesizing an array via use of an inkjet technology, wherein the method involves the attachment of molecules onto a substrate surface (page 1, lines 23-25), for sequential synthesis of polynucleotides (page 2, lines 1-3), wherein the reagents are dispensed from a microdrop dispensing device (page 3, lines 14-15).

The artisans teach the deprotection step (i.e., activation of the protected monomers) so as to "grow" the nucleotides thereto (page 4, lines 1-20).

Baldeschwieler et al. disclose that in an embodiment, a five jet system is used, each jet for dispensing one of the four nucleotide bases, and one jet for activating tetrazole solution (page 13, lines 7-10).

Baldeschwieler et al. disclose the use of computer in controlling the deposition process (page 19, lines 3-9).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Cantor et al. with the teachings of Baldeschwieler et al., thereby arriving at the claimed invention for the following reasons.

Cantor et al. already discloses a microarray comprising a plurality of degenerate oligonucleotides, said degenerate oligonucleotides comprising at least one degenerate nucleotides. While the artisans are not explicit in disclosing a particular method of fabricating such an array, one of ordinary skill in the art would have clearly recognized various methods for fabricating a microarray at the time the invention was made, including the method disclosed by Baldeschwieler et al.

Baldeschwieler et al. explicitly disclose a method of fabricating an array via use of an inkjet technology, wherein the method involves the attachment of molecules (biopolymer subunit precursors) onto a substrate surface (page 1, lines 23-25), for sequential synthesis (by multiple round of subunit additions) of polynucleotides (page 2, lines 1-3), wherein the reagents are dispensed from a microdrop dispensing device (page 3, lines 14-15).

Chetverin et al. disclose that rather than having four oligonucleotides that differ in one position and are immobilized in four separate areas of a comprehensive array, it may be convenient to immobilize "all of these four oligonucleotide in **one area**...[t]hus, instead of having the sequence 'AAAAAAA", "AAATAAA", AAAGAAA", and "AAACAAA" in separate areas, a comprehensive

array might be obtained if they are contained in the same area...[t]his would be analogous to having in this area an oligonucleotide with one position that is degenerate."

Clearly, synthesizing a plurality of oligonucleotides in one area, wherein one position is degenerate will result in the dispensing of different nucleotides in the same area (such as A, T, G, and C) in a single pass of nucleotide additions, rendering the instant invention as claimed *prima facie* obvious over the cited references.

Conclusion

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiries

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Young J. Kim whose telephone number is (571) 272-0785. The Examiner is on flex-time schedule and can best be reached from 8:30 a.m. to 4:30 p.m (M-W and F). The Examiner can also be reached via e-mail to Young.Kim@uspto.gov. However, the office cannot

guarantee security through the e-mail system nor should official papers be transmitted through this route.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Gary Benzion, can be reached at (571) 272-0782.

Papers related to this application may be submitted to Art Unit 1637 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant does submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office. All official documents must be sent to the Official Tech Center Fax number: (571) 273-8300. For Unofficial documents, faxes can be sent directly to the Examiner at (571) 273-0785. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Young J. Kim/
Primary Examiner
Art Unit 1637
3/20/2008